

7. (Amended) The [milling cutter] cutting tool as claimed in claim 1, which is applied to a face milling cutter or end mill for high speed cutting cast irons or steels.

8. (Amended) The [precision] cutting tool as claimed in claim 1, wherein the cubic boron nitride sintered compact, at the said edge part, contains cBN with an average grain diameter of at most 0.5 μm .

REMARKS

Claims 1 through 10 are pending in this application. In response to the Office Action dated January 12, 2001, claims 5 through 8 have been amended to address a perceived antecedent bases issues. Care has been exercised to avoid the introduction of new matter.

Appended hereto as Appendix A is a clean copy of the claims amended.

Claims 5 through 8 were rejected under the second paragraph of 35 U.S.C. §112.

In the statement of the rejection, the Examiner identified bases in claims 5 through 8 perceived to render the claimed invention indefinite for lack of antecedent basis. This rejection is traversed.

In response, claims 5 through 8 have been clarified to address the antecedent basis issues raised by the Examiner. Clearly, one having ordinary skill in the art would have no difficulty understanding the scope of the claimed invention, particularly when reasonably

interpreted in light of and consistent with the written description of the supporting specification. **Zoltic Corp. v. United States**, ___ F.3d ___, 57 USPQ2d 1257 (Fed. Cir. 2000). Applicants, therefore submit the imposed rejections of claims 5 through 8 under the second paragraph of 35 U.S.C. §112 has been overcome and, hence, solicit withdrawal thereof.

Claims 1 through 8 were rejected under 35 U.S.C. §102 for lack of novelty or, alternatively, under 35 U.S.C. §103 for obviousness predicated upon each of U.S. Patent No. 5,691,260 (Suzuki '260), U.S. Patent No. 5,443,605 (Suzuki '605) and JP 09059068 (JP '068).

This rejection is traversed.

As to 35 U.S.C. §102, the factual determination of lack of novelty requires the identical disclosure in a single reference of each element of a claimed invention such that the identically claimed invention is placed into possession of one having ordinary skill in the art. **Helifix Ltd. v. Blok-Lok, Ltd.** ___ F.3d ___, 54 USPQ2d 1299 (Fed. Cir. 2000); **Electro Medical Systems S.A. v. Cooper Life Sciences, Inc.**, 34 F.3d 1048, 32 USPQ2d 1017 (Fed. Cir. 1994). Moreover, in imposing a rejection under 35 U.S.C. §102, it is incumbent upon the Patent and Trademark Office (PTO) to specifically point out wherein each feature of a claimed invention is identically disclosed in a single applied reference. **In re Rijckaert**, 9 F.3d 1531, 28 USPQ2d 1955 (Fed. Cir. 1993); **Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.**, 730 F.2d 1452, 221 USPQ 481 (Fed. Cir. 1984). That burden has not been discharged. In addition, there are significant differences between the claimed invention and the applied prior art that scotch the factual determination that any of

the applied references identically describes the claimed invention within the meaning of 35 U.S.C. §102. Furthermore, a prima facie basis to deny patentability under 35 U.S.C. §103 has not been established.

The PTO's case to deny patentability to the claimed invention is predicated upon inherency. In order to invoke the doctrine of inherency, it is incumbent upon the PTO to provide a basis in fact and/or cogent technical reasoning upon which to predicate the determinations that the allegedly inherent features necessarily flow from the teachings of the applied prior art and would have been recognized by one having ordinary skill in the art. **Finnegan Corp. v. ITC, 180 F.3d 1354, 51 USPQ2d 1001 (Fed. Cir. 1999); In re Robertson, 169 F.3d 743, 49 USPQ2d 1949 (Fed. Cir. 1999).** Moreover, the doctrine of inherency can not be used to improperly shift the burden to Applicants, thereby denying them procedural due process of law.

The PTO's case is predicated upon the erroneous assumption that all sintered boron nitride products having a particular grain size necessarily exhibit properties identical to those specified in the rejected claims, **and Applicants separately argue the patentability of each claim.** However, the Examiner has **not** provided a basis in fact to support that assumption. In this respect, Applicants would rely to the recent decision by the Honorable Board of Patent Appeals and Interferences in **Ex Parte Schricker, 56 USPQ2d 1723 (BPAI 2000).** Applicants would refer to the following holding by the Honorable Board which appears at 56 USPQ2d 1725;

However, when an examiner relies on inherency, it is
incumbent upon the examiner to point to the "page and line" of
the prior art which justifies an inherency theory.

Simply put, the PTO has **not** identified any factual basis upon which to predicate the determinations that any sintered cubic boron nitride which happens to have a certain grain size necessarily exhibits the diffraction intensity ratio specified in independent claim 1, the thermal conductivity specified in claim 2, the transverse rupture strength specified in claim 3, the hardness specified in claim 4, the thermal conductivity specified in claim 5, or the thermal expansion coefficient specified in claim 6. **Ex Parte Schricker, supra.** Significantly, in support of its holding, the Honorable Board relied upon **In re Rijckaert, supra.**, which requires the PTO to specifically identify wherein an applied reference discloses each feature of a claimed invention.

The bottom line is that the PTO did not provide any basis upon which to invoke the doctrine of inherency. Moreover, there is an abundance of evidence in the specification which undermines the inherency theory. In this respect, it should be apparent from Tables 2 through 6 that various factors impact the properties of the resulting cutting tool, including the starting material and methodology, particularly, the temperature. Thus, not only did the PTO fail to provide a factual basis upon which to invoke the inherency theory, the evidence in the specification undermines the notion that all sintered boron carbide articles exhibit the properties recited in the claims.

Applicants would note that on page 5 of the written description of the specification, references are cited which disclose a method comprising comparing cBN from pyrolytic boron nitride (pBN). However, these cBN sintered compacts are problematic in that compressed hBN crystals at an ultra-high pressure tend to remain in the cBN sintered compact and exhibit a strong orientation property (anisotropic property) of cBN crystals,

resulting in laminar cracking or stripping. Significantly, one of the references, **JP-8-63-394**, discloses that when employing pBN as a raw material, the resulting cBN sintered compact is highly oriented in the (111) direction and the (220) reflection in x-ray diffraction intensity is very weak or lacking. The corresponding U.S. Patent of JP-8-63-394 is U.S. Patent 4,188,194, which is mentioned by **Suzuki '260**. Suzuki '260 employs similar raw material and similarly discloses that $I(220)/I(111)$ is 0.

In contradistinction to Suzuki '260, the present invention requires a large diffraction intensity ratio evincing an isotropic structure. In this case, disadvantages such as laminar cracks and stripping are avoided.

Suzuki '605 discloses abrasive grains and is completely mute as to sintered compacts for cutting tools. The disclosure of a grain size of less than 1 μm simply refers to polycrystalline abrasive grains for grinding. Suzuki '605 neither discloses nor suggests a sintered compact for cutting.

JP '068 merely describes a sintered compact characterized by introducing carbon (50 to 5000 ppm C, 0 to 5000 ppm O). However, it should be apparent from the written description of the specification, that the sintered compact of the present invention is carbon-free, i.e., a high purity sintered product, completely different from that of JP '068. Indeed, in accordance with the present invention, the specified treatment is carried out to decrease the quantity of oxygen from the raw materials and, even if carbon is present in raw material in an amount less than a measurable limit, it reacts with oxygen to form carbon dioxide.

Claim 3

Applicants separately argues the patentability of claim 3 which recites a particular transverse rupture strength as measured by a three point bending measurement at a temperature up to 1000°C. Such properties cannot be derived from the applied prior art. Indeed, Suzuki '260 discloses a product with a strong orientation so that breakage due to laminar stripping often occurs and a high rupture strength cannot be achieved. In the methodology disclosed by JP '068, oxidation reaction of carbon begins at 500 to 700°C with rising temperature because of the carbon which results in lowering of the strength of the sintered compact.

Based upon the foregoing differences, it is apparent that the PTO did not establish a prima facie basis to deny patentability to the claimed invention under 35 U.S.C. §102. **Minnesota Mining & Manufacturing Co. v. Johnson & Johnson Orthopaedics Inc., 976 F.2d 1559, 24 USPQ2d 1321 (Fed. Cir. 1992); Kloster Speedsteel AB v. Crucible Inc., 793 F.2d 1565, 230 USPQ 81 (Fed. Cir. 1986).** Moreover, the PTO did not make any particular factual findings as to any specific understanding or specific technological principle which would have realistically impelled one having ordinary skill in the art to modify any of the products disclosed in the applied references to arrive at the claimed invention as judicially required. **Ruiz v. AB Chance Co., ___ F3d ___ 57 USPQ2d 1161 (Fed. Cir. 2000); Ecolchem Inc. v. Southern California Edison, Co. ___ F.3d ___, 56 USPQ2d 1065 (Fed. Cir. 2000); In re Kotzab, 217 F.3d 1365, 55 USPQ 1313 (Fed. Cir. 2000); In re Dembiczak, 175 F.3d 994, 50 USPQ2d 1614 (Fed. Cir. 1999).**

Applicants, therefore, submit that the imposed rejection of claims 1 through 8 under 35 U.S.C. §102 for lack of novelty or, alternatively, under 35 U.S.C. §103 for obviousness predicated upon each of Suzuki '260, Suzuki '605 and JP '068 is not factually or legally viable and, hence, solicit withdrawal thereof.

Claims 9 and 10 were rejected under 35 U.S.C. §103 for obviousness predicated upon Kawasaki in view of Ogasawara, Suzuki '605 or Suzuki '260.

In the statement of the rejection, the PTO concluded that one having ordinary skills in the art would have been motivated to employ hexagonal boron nitride particles in the methodology of Kawasaki et al. This rejection is traversed.

Applicants submit that the PTO did not establish the requisite basis upon which to predicate the conclusion that one having ordinary skill in the art would have been realistically impelled to employ hexagonal boron nitride particles in the methodology of Kawasaki et al. apart from improperly relying upon generalizations. **Ruiz v. AB Chance Co., supra.; Ecolchem Inc. v. Southern California Edison, supra.; In re Kotzab, supra.; In re Dembiczak, supra.**

Specifically, Ogasawara et al. merely discloses the preparation of boron nitride powder for the production of low pressure phase boron nitride (hBN) sintered compacts. Ogasawara et al. are not concerned with cBN. The hBN is employed as an additive in plastics, lubricants and the like in the form of a powder, and as jigs, electrical insulators, molds and the like in the form of composite shaped bodies. However, in accordance with the present invention, the hBN raw material is converted into hard cBN, which is completely

different from the teachings of Ogasawara et al. Similarly, Kawasaki et al. is directed to the use of hBN particles in forming sintered bodies.

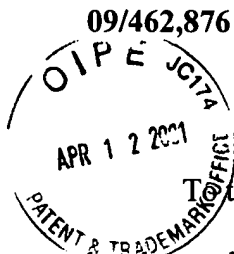
It is not apparent and the PTO has not explained how the conversion of such hBN to hard cBN is even consistent with the objectives of Kawasaki. It is well settled that one having ordinary skill in the art can not be considered realistically motivated to modify a reference in a manner inconsistent with the disclosed objectives. **In re Fritch, 972 F.2d 1260, 23 USPQ2d 1780 (Fed. Cir. 1992); In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984) In re Schulpen, 390 F.2d 1009, 157 USPQ 52 (CCPA 1968).**

It should, therefore, be apparent that a prima facie basis to deny patentability to the invention defined in claims 9 and 10 has not been established. Applicants, therefore, submit that the imposed rejection of claims 9 and 10 under 35 U.S.C. §103 for obviousness predicated upon Kawasaki in view of Ogasawara, Suzuki '605 or Suzuki '260 is not factually or legally viable and, hence, solicit withdrawal thereof.

Claims 1 through 10 were rejected on the ground of double patenting of the obviousness type over claims 1 through 27 of U.S. Patent No. 6,071,841 (the '841 Patent).

Applicants would consider submitting a Terminal Disclaimer upon an indication of allowable subject matter.

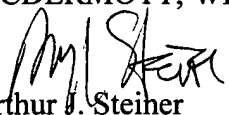
It should, therefore, be apparent that by the present Amendment and Remarks, the rejections of record have been overcome and this application is in condition for allowance. Accordingly, favorable consideration is solicited.



To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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